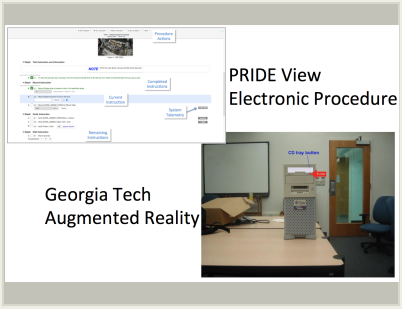
Context-Sensitive Augmented Reality for Mission Operations, Phase I

Completed Technology Project (2016 - 2016)

Project Introduction

Current NASA missions to the International Space Station are heavily dependent upon ground controllers to assist crew members in performing routine operations and maintenance as well as responses to off-nominal situations. Standard operating procedures are at the heart of spacecraft operations, with almost 5000 procedures for ISS alone. Performing these procedures often requires close collaboration between ground controllers who have deep knowledge of the spacecraft's systems and crew members who have on-board situation awareness. This close collaboration will become more difficult in extended missions and crew members will need to have more autonomy. Augmented reality technology can help replace some of the guidance that ground controllers offer to crew members during procedure execution. Augmented reality can also provide continuous and just-in-time training opportunities during extended missions as well as entertainment and social connection opportunities. Context-sensitive augmented reality provides different support depending upon the on-board situation and ties directly to procedures, system data, daily plans, background information, and robotic assistants. TRACLabs has developed a procedure integrated development environment called PRIDE that is currently being used by NASA for ISS and Orion procedures. TRACLabs proposes to integrate augmented reality technologies into PRIDE in collaboration with the Georgia Tech Augmented Environmental Lab. In particular, Georgia Tech has developed an augmented realty capable web browser and Javascript framework that will complement the PRIDE web-based procedure execution system. These two industry-leading technologies will form the platform on which a suite of context-sensitive augmented reality applications can be quickly developed and deployed for a variety of NASA applications.



Context-sensitive Augmented Reality for Mission Operations, Phase I

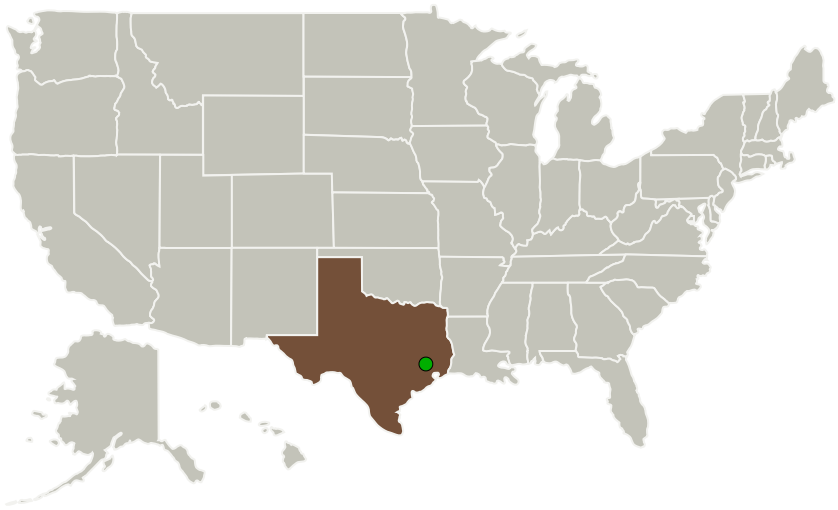
Table of Contents

Small Business Innovation Research/Small Business Tech Transfer

Context-Sensitive Augmented Reality for Mission Operations, Phase I

Completed Technology Project (2016 - 2016)

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
TRACLabs, Inc.	Lead Organization	Industry	Webster, Texas
Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas

Primary U.S. Work Locations
Texas

Project Transitions

June 2016: Project Start

December 2016: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139657)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

TRACLabs, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

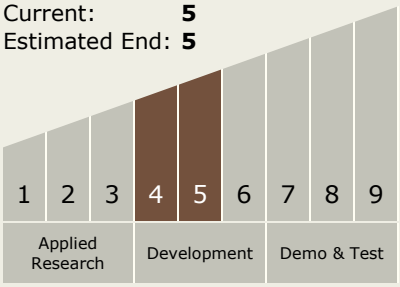
Carlos Torrez

Principal Investigator:

David M Kortenkamp

Technology Maturity (TRL)

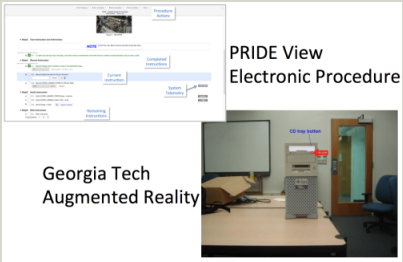
Start: **4**
Current: **5**
Estimated End: **5**



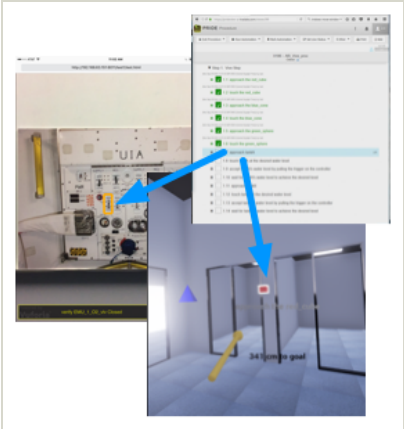
Context-Sensitive Augmented Reality for Mission Operations, Phase I

Completed Technology Project (2016 - 2016)

Images



Briefing Chart Image
Context-sensitive Augmented Reality for Mission Operations, Phase I
(https://techport.nasa.gov/image/135875)



Final Summary Chart Image
Context-sensitive Augmented Reality for Mission Operations, Phase I Project Image
(https://techport.nasa.gov/image/132261)

Technology Areas

Primary:

- TX04 Robotic Systems
  - TX04.4 Human-Robot Interaction
    - TX04.4.1 Multi-Modal and Proximate Interaction

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System